

Electricity in Gynecology

ELECTRICITY ✓

IN

GYNECOLOGY.

BY

A. D. ROCKWELL, M.D., A. H. GOELET, M.D.,
E. L. H. MCGINNIS, M.D., A. H. BUCKMASTER, M.D.,
A. LAPHORN SMITH, M.D.,
FRANKLIN H. MARTIN, M.D., G. BETTON MASSEY, M.D.
AND
ALEXANDER J. C. SKENE, M.D.



FROM

THE MEDICAL NEWS,

January 25, 1890.

SUBSCRIPTION PRICE REDUCED TO \$4 PER ANNUM.

THE MEDICAL NEWS.

THE year 1890 witnesses marked changes in THE MEDICAL NEWS.

Convinced by the growth of fifty per cent. which has followed the appearance of THE AMERICAN JOURNAL OF THE MEDICAL SCIENCES in its new form at a reduced price, those in charge of THE NEWS have taken a similar step with it, beginning with the first issue for 1890, at which date the subscription price was reduced to \$4.00 per annum.

Cognizant of the value of the busy practitioner's time, THE NEWS aims to supply, in the most concise form, and in an attractive shape, such material as must prove of the greatest interest and utility. Short contributions, therapeutically suggestive, from the foremost minds in the medical world, appear in each issue; hospitals and clinics are drawn upon for information as to the latest methods of procedure; the medical press of both continents is weekly represented by condensed extracts; editorial consideration by recognized authorities is given to varied matters of professional interest; society proceedings appear in a very condensed form, and a competent corps of local correspondents covering all centres of medical importance promptly report by mail and telegraph all news of medical interest.

Three new departments have been instituted, viz: *Clinical Memoranda*, *Therapeutical Notes* and *Correspondence*. In these are presented at regular intervals, such material as must prove to be of the greatest practical assistance to the physician in his daily round.

In a word, THE NEWS will be found a crisp, fresh *medical newspaper*, of interest to every live practitioner, and will be sent every Saturday, post-paid, on receipt of

\$4 PER ANNUM. PUBLISHED WEEKLY.

For commutation rates, premiums, and special offers, see p. 4 cover.

LEA BROTHERS & CO., PUBLISHERS, PHILADELPHIA.

[Reprinted from THE MEDICAL NEWS, January 25, 1890.]

**GENERAL OBSERVATIONS ON THE USE OF
ELECTRICITY IN GYNECOLOGY.¹**

BY A. D. ROCKWELL, A.M., M.D.,
PROFESSOR OF ELECTRO-THERAPEUTICS AT THE NEW YORK POST-
GRADUATE MEDICAL SCHOOL AND HOSPITAL.

UNTIL a recent period the advances in the therapeutic uses of electricity were more especially along the line of those distinctively nervous affections that were neither specific nor structural in their nature. Cases of this latter type have always yielded but meagre results under electrical treatment, and I do not know that any competent authority seriously claims for electricity in most cases of structural disease of the central or peripheral nervous system, more than temporary and palliative effects. And yet those who, arguing on the side of their prejudices, or out of the fulness of their ignorance of the subject, ascribe to electricity a very low place in therapeutics, do so mainly on the basis of its failure to cure a class of conditions incurable by any method of treatment.

The statement that as a therapeutic agent "the

¹ Read before the New York Academy of Medicine, Section in Obstetrics and Gynecology, November 27, 1889.



effects of electricity are limited," must indeed seem a rash observation to those who have had repeated evidence of the wide range of its influence in the relief of nervous symptoms, and especially so to those who have witnessed the really remarkable relief so often afforded by intra-uterine applications of the galvanic current. When a man possessed of the experience of Keith, of Edinburgh, can say that many are prejudiced against electricity because they consider it quackery and know nothing about it; that his confidence in its power to relieve disturbing symptoms of uterine fibroids and to cure many chronic inflammatory conditions of the pelvis, continues to increase, and that he has no fear for the future of electricity, we have testimony that must greatly outweigh assertions and opinions that are purely negative.

In a recent and animated discussion of the subject at the Société de Chirurgie of Paris, equally favorable opinions were advocated by the majority of those engaged in the debate, and the strength of these opinions was accentuated by the fact that the majority of those who hold them are signally distinguished as laparotomists.

I do not propose here so much to give the results of my own experience in gynecological electrotherapeutics as to allude, and very briefly, to some points in the rationale of its effects.

I call attention first to the faradic current. Its effects are mainly mechanical, and according to the construction of the helix and the length and thickness

of the wire do we measure its action on the muscular tissues of the uterus. Applied directly to the uterus of animals in physiological experiments, the organ visibly contracts, although not to such an extent as the intestines, which, on application of the electrodes, can be seen to draw up gradually very much after the manner of a woman's work-bag. Its action on the smooth muscular fibres of the human uterus, when applied therapeutically is analogous to that of ergot, although manifestly more prompt and energetic, especially under the influence of the positive pole, which possesses a much greater power over the involuntary muscles than the negative. It is a current of alternation, of constant closing and breaking, hence it produces a sort of interstitial massage, heightening the activity of the circulation, accelerating absorptive processes, and influencing favorably the nutrition of parts.

Faradization, by its power over muscular contractions, sensibly increases temperature. According to the chemistry of the development of heat during muscular contractions, muscular work is the result of the decomposition of nitrogenous substances, and the muscles grow at the same time that they work and develop heat. That the value of the faradic current is more limited than the galvanic in the treatment of uterine disease must be immediately manifest to all who appreciate the difference between them, but in some conditions which come within the range of its physical and physiological activities, the faradic current may exceed in efficiency the

4 ELECTRICITY IN GYNECOLOGY.

galvanic. By its direct excitation of the smooth muscular fibres of the uterus we are enabled to combat that stasis of the circulation which is the beginning of uterine inflammation.

By this method we obtain a veritable interstitial massage that is potent in overcoming the primary inertia of the organ, and in preventing an arrest of retrograde metamorphosis, through which comes sub-involution with its inevitable and persistent sequelæ. In its purely local influence, then, faradization would seem to be preventive rather than curative, as it relates to uterine disease; or rather it is preventive so far as concerns the latter condition of uterine engorgement, and curative only in its initial stage. When the processes that go to make up the graver and more chronic diseases of the uterine parenchyma and its lining membrane have continued a long time, as is usually the case when medical interference is sought, the simple mechanical effects of the faradic current would be altogether misdirected.

Here we resort to the electrolytic influence of the galvanic current, or rather to what may be more fitly termed its galvano-chemical cauterizing effects through which are destroyed the granulations and fungoid growths of the diseased mucous membrane. By the interpolar influence of the current we correct a languid nutrition and hasten the absorption of exudations.

Just as the positive pole of the faradic current has an action of its own, superior in effect to the nega-

tive in causing uterine contractions, so the positive pole of the galvanic current has an action peculiar to itself. Here oxygen is generated and acids accumulate, which render this pole directly hæmostatic. It is, therefore, indicated in all hemorrhagic conditions, as well as where there exists an excess of the natural secretions. Owing, also, to the greater retractibility of cicatrices following positive galvanocauterization, the results are more lasting in the treatment of fungoid growths, or vegetations, than could possibly be the case with the negative pole.

At the negative pole, on the contrary, the alkalies precipitate, imparting caustic properties and causing effects fluidifying rather than hæmostatic. The absorptive process is undoubtedly more active under this pole than under the positive, and is especially indicated in indurated chronic metritis and for the resolution of fibroids.

That the galvanic current often completely dissipates fibroid tumors of the uterus few will, I believe, affirm. In the treatment of scores of fibroids on the external surface of the body, I have never yet seen a single instance where one of them completely disappeared. As a rule, the reduction is comparatively slight, unless suppuration is excited, which may be easily done. External fibroids are simply unsightly, and for this reason we desire to be rid of them, and as it is not possible to obtain more than a reduction in size, the knife is to be preferred, and electrolysis has fallen into disuse. We treat uterine fibroids, on the contrary, not because they

6 ELECTRICITY IN GYNECOLOGY.

are unsightly, but because associated with them are a train of symptoms sometimes of the most distressing character. These symptoms can, it is believed, be relieved to a greater or less extent by electrolysis, and sometimes so completely relieved as to lead to the belief, so far as the patient is concerned, that the tumor has entirely disappeared. In the great majority of cases, however, it is simply a symptomatic cure. The tumor is still there, but reduced in size, and so far as pressure upon surrounding parts is concerned, or any hemorrhagic tendency, is entirely harmless. I am a firm believer in the great utility of the galvanic current in the thickenings and infiltrations resulting from inflammation of the pelvic cellular tissue. For the absorption of old exudations in other parts of the body, this treatment has long been used with excellent results, and in pelvic exudations the results are even better. I have seen the treatment, persistently carried out, result not only in the absorption of large pelvic deposits, but in the cure of the most obstinate and severe sciatica, and in the restoration of power to partially paralyzed limbs. In such cases, both sciatica and paralysis are caused, undoubtedly, by pressure upon the pelvic floor, and can be relieved only through the dissipation of the morbid products.

There are two methods of action through which we obtain results from electrolysis. The first and most apparent is the absolute destruction of tissue which takes place at the time of treatment. Some suppuration may follow, and thus, by an actual loss

of substance apparent to the sight, the tumor decreases in size. If, however, these were the only active forces in the electrolytic process, the method would lose much of its effectiveness.

If this be not so, how can we account for the many well-attested cases where morbid growths have entirely disappeared under simple external applications? Herein is the difference between the electrolysis of organic and inorganic substances. In the electrolysis of inorganic substances the effects cease as soon as the current ceases, the substances remaining in the condition that the current left them. The electrolysis of organic substances, on the contrary, starts a process that continues long after the current ceases to flow. Beside this subsequent effect, the current penetrates the tissue and induces various important changes beyond and beneath the eschar, and these combined agencies do far more, in many cases, to diminish the size of morbid growths and prevent further development than an actual destruction of a limited area.

A word in regard to the use of electricity for the relief of pain. No one can deny the excellent results that frequently follow the application of the galvanic and, indeed, of either current in uterine and ovarian pain, and as a somewhat extraordinary illustration of this I beg, in conclusion, to relate briefly a single case:

The patient was a married woman, aged thirty, and was referred to me, March 15, 1886, by Dr. J. O. Farrington, of this city, under whose care she

had been for some time. She sought relief for pains in the ovarian region that were not only excessive, but most persistent, in spite of all efforts for her relief—including extirpation of both ovaries.

She had suffered more or less at each menstrual period for six or seven years, but for two years previous to the operation to which she had submitted, the pain had been so agonizing as to render her life absolutely unendurable. While the menstruation was scanty, it was nevertheless always on time, and continued during a period of nearly two weeks in a halting, irregular manner and with few intermissions. Everything attempted for her relief having failed, it was proposed to remove both ovaries, a proposition to which the patient eagerly consented, and, on the 3d of July, 1884, the operation was successfully performed by Dr. T. G. Thomas.

To the concern of all interested, however, the periodical appearance of blood still continued to some extent, associated with pains less acute, but still of a severe type.

The flow gradually disappeared, but the pains increased, coming on at regular intervals until, at the end of nine months, they were quite as distressing as at any previous time, and so continued until I saw her, through the kindness of Dr. Farrington, about a year subsequently. Under internal applications of the galvanic current, varying from twenty-five to fifty milliamperes in strength, the paroxysms began to yield rapidly, resulting in a few months in a complete and what has been demonstrated a permanent recovery, for in the three years that have elapsed since the treatment was discontinued there has been no return of pain.

A very important practical question must immediately suggest itself to every one who reads the account of this case, as it did to the patient herself. If the treatment by the galvanic current had been attempted first instead of last, would it have been necessary to perform the formidable operation that she underwent?

While I cannot presume to answer this question, it is self-evident that an agent like the galvanic current, possessing such a marked influence over so many forms of pain of obscure origin, should precede rather than follow severe operative procedures for their relief.

**THE TREATMENT OF CERTAIN PELVIC TUMORS
BY GALVANO-PUNCTURE, DRAINAGE BY
THE VAGINA, AND INTRA-UTERINE
GALVANIZATION.**

BY AUGUSTIN H. GOELET, M.D.,
OF NEW YORK.

I DESIRE to be understood, in the beginning, as referring only to such tumors as are easily accessible by the vagina for galvano-puncture, and to those which are so intimately associated or connected with the uterus as to be influenced by the chemical galvano-caustic applications to the endometrium, and trust that I may be pardoned for including under this caption pyosalpinx and hydrosalpinx.

The subject of aspiration and drainage by the vagina is not new, but it is a method which has been almost abandoned of late in favor of laparotomy and drainage through the abdomen. I believe, however, than I can present it in a more favorable light than has heretofore surrounded it. With our present perfected knowledge of antiseptics, there cannot possibly be the same objection to this outlet which formerly existed; besides, the addition to our resources of the antiseptic power of the galvanic current renders puncture and aspiration by the vagina harmless,

12 ELECTRICITY IN GYNECOLOGY.

when the condition is appropriate and the degree of penetration is limited. Apostoli says :

"I have found that the galvanic current sent through culture media of pathogenic microbes is *germicide*, which confirms what I said long ago, that this current was *antiseptic*, and would *attenuate* or *sterilize* certain conditions of germ growth."

This, then, is one explanation of the success following vaginal punctures and aspiration by this method. I refer more particularly to the method of aspiration and drainage of fluctuating tumors by the vagina, as described in the *New York Medical Journal* of June 8, 1889. And I think that the general good results which I have obtained justify me in preferring and strongly advocating this method of treatment, in certain appropriate conditions, in lieu of other methods now in vogue.

Dr. H. R. Bigelow, in THE MEDICAL NEWS, May 18, 1889, writing from Paris, says :

"In the French Academy of Medicine they are discussing methods of drainage by uterus and vagina, without the necessity of operating, so that the minds of the surgeons themselves are turned in conservative directions. I am sure that the time is in the near future when electricity shall solve the riddle."

As there may be some who have not read the article to which I refer, I will briefly describe the method and the trocar and canula which I use. It is a very fine silver canula, the size being No. 4 of the French scale, with a steel trocar, and

covered with a slide of insulating material, which may be fixed by a screw to the shaft of the canula, so as to limit the degree of penetration. It is only capable of penetrating two centimetres, and it is seldom necessary to exceed one centimetre. The trocar is arranged for connecting with the battery, and the canula is made so as to be easily attached to an aspirator.

The method of application is simple; after deciding upon the degree of penetration necessary, the slide is fixed, and the trocar point is drawn within the canula. The vagina and vulva are douched thoroughly with a solution of bichloride, the index finger is introduced and, taking care to avoid any pulsating vessel, the most dependent point is selected. Then the canula, with the point of the trocar concealed, is passed along the finger until it impinges against the point selected, the trocar is pushed down into place, and the canula is made to penetrate to the limit fixed by the slide. The trocar being then withdrawn, if no fluid escapes, the slide is readjusted lower down, and the canula, without the trocar, is introduced a little farther. When the fluid has been evacuated, the trocar is partially re-introduced and connected with the battery, the circuit being completed by a large clay electrode on the abdomen or back. In hydrosalpinx, the negative pole is used through the canula, with not more than 50 M. for five minutes; but in pyosalpinx, the cavity must be washed out with an antiseptic solution, as an extra precaution, and I prefer the posi-



The cut shows a platinum canula and trocar (No. 4. French catheter scale) made for me by Mr. Reynders, for the galvano-tapping of pyosalpinx through the vagina. The shaft is covered with an adjustable sheath (*A*) of hard rubber for insulation. This may be fixed at any point by the screw *B* and the degree of penetration limited. At *C*, there is a three-way stopcock, and at *D*, a connection for an irrigator, as well as a socket for connecting with the battery. When the pus has been withdrawn, an aspirator may be attached to the rubber tubing *E*, and, after the pus has been drawn off by a quarter turn of the stopcock *C* the cavity may be flushed with an antiseptic solution, passing in at *D* through the canula. By turning the stopcock straight again, the fluid is allowed to escape through the tubing *E* into the aspirator bottle. Care must be observed not to over-distend the Fallopian tube, the walls of which have been much weakened in some cases. That I may not be misunderstood, I repeat that I limit the degree of penetration usually to one centimetre, and deem the procedure appropriate only when the tube is close to the vaginal wall, full and tense, demanding immediate interference.

tive pole because it is less irritating, and is believed to be more antiseptic, using 50 M. for five minutes. When the positive pole is applied, a canula made of platinum should be used, as the silver would be acted upon and unnecessary irritation provoked.

The cauterization of the track of the puncture by the current shuts it off from the surrounding tissues and renders the absorption of septic material through that channel impossible, and by using a safe intensity, not exceeding 30 to 50 M. for five minutes, nothing unpleasant is to be apprehended. (The higher intensities necessary for fibroids are not to be thought of in these conditions.) The opening remains pervious a short time for drainage, and closes readily when it ceases, and if a dressing of iodoform gauze is frequently renewed in the vagina, there is nothing to be apprehended from that source. Resolution in the diseased tube is promoted by the influence of the current and is subsequently still farther favored by mild positive galvanism of the endometrium, which will likewise be appropriate for the coexisting endometritis. I limit this treatment by aspiration to such tubes as are close to the vaginal wall, and where fluctuation may be distinctly felt. These tubes are usually fixed by a mass of exudation.

In these conditions, Apostoli adopts a somewhat different course. He punctures with his ordinary puncture needle, and allows the pus either then or subsequently to drain into the vagina through the puncture. But it appears to me that the method

16 ELECTRICITY IN GYNECOLOGY.

here suggested is better, because it at once gets rid of the accumulation which is a constant menace to the patient as long as it remains, and the cavity is rendered aseptic and put in the best possible condition for resolution. Dr. Bigelow says he has seen Apostoli puncture a pyosalpinx, enlarge the opening, and insert a drainage-tube with good result.

This treatment of hydrosalpinx was suggested to me by the radical cure of three cases of hydrocele by the same method. They had repeatedly refilled after ordinary tapping, but never refilled after using negative galvanism through the canula.

Small cysts close to the vaginal wall have been successfully treated in the same way. I have found one application usually sufficient in these small cysts, when the fluid is drawn off first and a current of 100 M. to 150 M., negative, is used through the canula.

The fibro-cyst is sometimes more obstinate in yielding to this treatment, especially those lined with a secreting membrane. Some I have found to yield to one tapping and negative galvanism of 100 M. through the canula; but in other cases it has been necessary to make the application directly to the cavity. This is done by enlarging the opening with gradually increasing sizes of conical electrodes connected with the negative pole, until it will admit a bulb-electrode into the cavity. This bulb is fixed upon a small insulated shaft which is flexible, and through it a current of 150 to 200 milliampères is

concentrated within the sac. If drainage is not perfect through the opening, a rubber drainage-tube is inserted and fastened in position. A frequently renewed dressing of iodoform gauze is kept in the vagina.

I will cite one case here which will illustrate the success following this method of treatment:

The patient is married, and forty-one years old; one child at term, and one miscarriage. She has suffered for eight years at her menstrual periods with severe pain in the left side of the pelvis, radiating down the thigh, which often compels her to remain in bed for days at a time. Two years ago she was induced to visit the clinic of the Post-graduate School, where she saw Dr. Bache Emmet, who diagnosed a fibroid tumor the size of a quart bowl. She was placed under the care of Dr. A. P. Dudley, who offered to remove the ovaries. This she declined. She continued to suffer, growing worse all the time, the attacks of pain being more severe and their duration longer, so that never a month passed that she did not find it necessary to keep her bed for ten days to two weeks at a time, and, at the same time, keep under the influence of opiates. This was her condition in February last when she consulted me. I found the tumor to the left of the uterus, to which it was attached near the cervico-vaginal junction, and close to the vaginal wall. I also diagnosed a fibroid, and commenced treatment by galvanism. The intra-uterine applications were not well borne, so on February 26th, I made the first negative galvano-puncture through the vagina, using 250 M. for five minutes. This puncture was imme-

diately followed by a discharge of an ounce and a half of yellow fluid, which caused me to suspect the cystic character of the tumor; but as it did not continue, and the tumor was very firm, I concluded that it was only a small cyst on the surface, which had been emptied.

March 5, the *second* negative galvano-puncture of 250 M. for five minutes was made. No discharge followed. Her menstruation appeared two days later, and there was much less pain than before.

March 12. Menstruation having ceased, the *third* galvano-puncture was made. This time the positive pole was used with 300 M. for five minutes.

April 10. The *fourth* galvano-puncture, negative, 200 M. for five minutes.

18th. The *fifth* galvano-puncture, negative, 200 M. for five minutes.

25th. The *sixth* galvano-puncture, negative, 200 M. for seven minutes.

A week after this puncture a copious watery discharge suddenly came from the vagina, and continued to flow away in gushes. Investigation showed that it had come from the last puncture-track. The opening was enlarged, and the sound could be passed up four inches into a cavity. All the fluid was drawn off, but the discharge continued for two weeks—as much as a pint a day.

May 18. A bulb electrode was introduced, and 150 M. negative galvanism applied to the cavity for eight minutes. Three days later all discharge ceased. She has had no pain since, and her menstruation has been normal. At the present time—six months since the last application—she is in perfect health. What remains of the tumor is about the size of a hen's egg. It gives her no incon-

venience whatever. She has been seen recently by Dr. Dudley, who can vouch for her present condition.

The dermoid cyst may be treated in the same way as the fibroid cyst, when it contains only sebaceous matter, for the negative pole will soften it, and allow it to drain away. My experience is limited to one case in the pelvis, though I have succeeded in curing several on the surface of the body by this method. In this instance the tumor had been diagnosed as a small fibroma. At the first puncture a cavity was discovered, but there was no drainage from it. On enlarging the opening as before described, and exploring the sac, the nature of its contents was ascertained. Fifty milliamperes negative galvanism were applied to the interior of the sac, a drainage-tube inserted, and a dressing of iodôform gauze placed in the vagina. This application was repeated every second day. Eight negative galvano-caustic applications were sufficient to empty the cyst completely. It soon ceased to discharge and healed up. Now, four months after, there is scarcely a trace of it to be felt.

I fully realize that such treatment could have no effect upon the bone, hair, and teeth often found in these cysts, but these might be removed through the opening if the tumor was situated close to the vaginal wall. In the case just mentioned the cyst contained only sebaceous matter.

The condition known as chronic pelvic cellulitis, which is usually manifested by a mass of exudation

20 ELECTRICITY IN GYNECOLOGY.

in one or both broad ligaments, including the tube and ovary, and associated with salpingitis and endometritis, yields very satisfactorily to galvanism of the endometrium. But it is very important to begin the treatment with a small dose—say 20 to 30 M.—for three to five minutes every second or third day, using the positive pole. And it is sometimes even better to begin with vaginal applications. The dose may be increased to 50 M. as tolerance is established. Later in the course of treatment it may become necessary to substitute the negative pole or vaginal puncture to hasten absorption. This condition dooms the patient to a life of misery, constantly threatened with peritonitis. Laparotomy does not always cure; but, by galvanism, she can be promptly relieved of pain, the deposit is softened and absorbed, the inflammatory complications are removed, and she is eventually restored to health with her ovaries and tubes intact and with a chance of conception. A case of this kind has recently come under my observation, and though it is only one of many others, some points in connection with it may be of interest here.

The patient had a miscarriage two years ago, and an attack of acute pelvic cellulitis in January last, from which she recovered partially, so as to be able to go about, but always suffered great pain in the right side of the pelvis on standing, walking, or riding. Frequently the attacks of pain were so sharp as to send her to bed for several days, especially at the menstrual period. In the beginning of October she

visited a clinic in this city, and was told that she had a tumor which was liable to burst and cause her death, and that it must be removed without delay. Careful examination, under chloroform, shortly after, when she consulted me, failed to reveal anything except a firm mass of exudation surrounding the right tube and ovary, and a retroflexed uterus partially fixed. The mass was extremely sensitive to touch, and the patient could scarcely walk a block. Treatment was begun with 30 M. positive galvanism, intra-uterine, three times a week, and the dose gradually increased to 60 M. She ceased to complain of pain after the sixth application. At this date she has had ten applications, and her improvement is marked. She can walk or ride any distance without pain or inconvenience, and is able to do her own work. The mass is less than half its original size, and not sensitive to ordinary pressure.

All of these cases, however, especially those of long standing, do not yield so readily to the intra-uterine applications alone, and it is then necessary to resort to vaginal galvano-puncture as advised by Apostoli. He uses a very fine needle, adjusted so as to penetrate only a half centimetre, using fifty milliamperes, positive, for five minutes. I have seen marked benefit follow such punctures, both in my own cases and those which I saw treated at his clinic. The patients themselves remark the increased benefit following this form of treatment. It may be more painful at the time, but the result, they say, outweighs the pain of the application.

The intra-uterine chemical galvano-caustic appli-

cations exert a decided influence upon fibroid tumors attached to the uterus, but which are not accessible for vaginal puncture, especially if they can be treated by including the growth between the two poles for the interpolar action. Dr. J. H. Gunning, of this city, tells me that he has had remarkably good results from the interpolar action of the current alone.

It would seem unnecessary to add further testimony in favor of the treatment of uterine fibroids by electricity, since such authorities as Spencer Wells and Thomas Keith have abandoned hysterectomy and openly avow themselves in favor of Apostoli's method. But there are some who refuse to be convinced, and some who, having tried it improperly and failed, are unwilling to admit that any good can come of it.

As to fibroids,¹ it does not always dissipate the tumor entirely, but the size is very materially lessened; its growth is arrested, and the symptoms are relieved. The pain is promptly lessened, hemorrhage is absolutely controlled, and, as the tumor becomes reduced in size, the pressure symptoms are likewise removed.

It sometimes requires a great deal of patience on the part of the physician, as well as the patient, and strong confidence in the agent, to make both hold out to a successful end. Thomas Keith truly says:

¹ Dr. Goelet stated that as others would discuss the subject of electricity in fibroids at the same meeting, it would be unnecessary for him to enter into it in detail.

"Apostoli's method, though slow, requiring much patience, tenderness of manipulation, and thought, is still sure in its results."

He also adds of electricity :

"My confidence in its power to relieve disturbing symptoms of uterine fibroids and to cure many chronic inflammatory conditions in the pelvis continues to increase, and I have no fears for the future of electricity. . . . Hysterectomy, remember, which is performed every day for a complaint that rarely of itself shortens life, kills every fourth or fifth woman who is subjected to it. This mortality must cease; it is not a question of surgery, it is a question of humanity. Every time that any disease can be cured without resorting to a bloody and dangerous operation, such as hysterectomy, progress is made in our art, and there is a gain to humanity, while surgery is the better of being purged of a deadly operation. Even the fact that in my cases of hysterectomy the removal of the uterus and ovaries was sooner or later followed by insanity in ten per cent. of the whole number, is enough for me to condemn any operation that removes these organs."

And this is the mature opinion of a most successful surgeon; one who was the first to lower the mortality of abdominal surgery.

The method of application should be more clearly explained and clinically taught in this country, for there are many to-day who have but a superficial knowledge of electricity, and some who are attempting to use this agent without even knowing the difference in the action of the galvanic and faradic currents, as well as many who do not realize the difference in the action of the two poles. This is a

deplorable fact, but, nevertheless, true, as the following incident will attest :

A lady consulted me recently about a tumor which proved to be a fibroid growing from the right side of the uterus. She volunteered the information that she had no confidence in electricity, because her physician had been treating her for the past six months with that agent, and it had not only done her no good, but she was worse. He had told her that he did not himself think it was suitable for her case after he had given it a thorough trial. On inquiry, I learned that he did not possess a galvanic battery, but had treated her with a small faradic battery, even puncturing with that current. That man is prepared to denounce electricity as worthless. This patient has now been under my care since the middle of September, has had twelve positive galvano-caustic applications to the uterine canal, and one positive galvano-puncture. Previous to consulting me, she suffered constant pain, menstruated twice a month, and for seven or eight days profusely. She has had no pain since the sixth application. Her last period, which was twenty-nine days after that of the previous month, lasted only three days. She is now progressing nicely, can walk or ride without pain or fatigue, and the tumor is smaller and very much softer.

After giving Apostoli's method, as I understood it, a thorough trial, I thought enough of it to visit him during the past summer and learn more about it. It is a mistake to suppose that any one can apply this method without special preparation or

instruction. And I am now satisfied that Apostoli is but poorly understood by many who think they can grasp his ideas by reading his writings. It is necessary to see its practical application in order to comprehend it fully, and there is too much in the method to be learned in one or two visits to his clinic, even by those who understand electricity. A correct diagnosis is the first requisite, then experience alone will enable one to decide the course to be pursued, else the negative pole will be used when the positive is indicated, and *vice versa*. It is very necessary to understand the technique of the application and to have confidence to administer it properly, taking care that self-confidence does not overstep the bounds of prudence. Always respect the actual suffering of a patient, but do not be deceived by her nervous apprehensions. By knowing the condition, experience will tell you nearly how much of galvanism she can bear. Apostoli has pointed out that in fibroids there is a comparative insensibility of the endometrium to the current, and he also lays stress upon the fact of the increased sensitiveness of the endometrium in inflammatory conditions of the appendages. The fact being, that in all these last-named conditions there always coexists an endometritis. But in uncomplicated endometritis the current is usually well borne. In treating diseases of the appendages, he says, begin always with the positive pole and a small dose and increase as tolerance is established. In fibroids, it is often possible to begin with 100 milliampères, and I have seen

26 ELECTRICITY IN GYNECOLOGY.

200 used in the uterus without causing the patient manifest inconvenience. I have likewise seen galvanopuncture of 200 milliampères borne without much suffering when the pole used was positive. These and many other important points can only be appreciated by watching his work at his clinic.

I followed him closely while there, and came away more than ever convinced of the general utility of electricity in gynecology. One cannot but be impressed with the method of his work, his honesty of purpose, and conscientious painstaking toward his patients, as well as the courtesy extended the physicians visiting his clinic. He exhibits with the most perfect freedom the histories of his cases, the records of his treatment, and the results. Every case treated there may be examined and questioned by any one present, and, if you do not request it, you are invited to examine the patient and express your opinion. The notes of progress and the treatment are announced to all present, and recorded by his assistant, and one is at liberty to verify any statement that is made. Since I have seen for myself, I have been astonished at the statements made by others, which are so contrary to my own experience.

In conclusion, I desire to say that I do not think any one should condemn Dr. Apostoli or his method until they have visited his clinic and witnessed his work and his results.

*THE GALVANIC TREATMENT OF UTERINE
FIBROMATA.*

✓
BY E. L. H. MCGINNIS, M.D.,

ELECTRO-THERAPEUTIST TO THE WOMAN'S HOSPITAL IN THE STATE OF
NEW YORK; FELLOW OF THE NEW YORK OBSTETRICAL SOCIETY,
OF THE PATHOLOGICAL SOCIETY OF NEW YORK, ETC.

I AM well aware that the above subject is one which has many times been written about, spoken about, and read about, and that there are few who have not already some idea of its utility; but there may be some who have formed opinions hurriedly or after insufficient trials, and as I welcome any additions to the literature on the subject, so have I ventured to hope that I could say something of interest to others.

It is needless for me to go into the history of this treatment of the uterine fibroid growth in detail, but as far back as 1871 Dr. Cutter had found the advantage of the continuous galvanic current, and since then many observers have been at work on it, and have from time to time published their memoirs on the subject.

There have been many different ways of applying the current to the tumor, all with the view of reducing its size and relieving the symptoms of this

most unfortunate affliction ; but I propose here to speak more especially upon a course of treatment which statistics and time have shown to be better in every respect than the others, viz., that first brought into prominence by its originator, Dr. Georges Apostoli, in an article read before the British Medical Association, in 1887.

He had then used it for five years, with most satisfactory results, and since that time he has steadily continued to study it in all its details, and reduce what had hitherto been a vague sort of empiricism to an exact science. This step in itself was all-important, for many had tried galvanism, with a large number of failures and only occasional successes, and of the latter no one seemed to know exactly why good had been done.

By the introduction of improved electrodes and a good milliamperemeter, however, we are now able to accomplish results entirely satisfactory to the vast majority of patients treated by it, and most gratifying to the attending gynecologist, and it is my firm belief that ere long its use will be universally recognized as the proper course to pursue before resorting to an operation the dangers of which we all know only too well.

Even to-day we come into contact with empiricism regarding the use of electricity, as it is practised by charlatans or those ignorant of its proper handling. I have been told by patients, of the faradic, interrupted galvanic, and static currents having been used on them for the cure of their fibroids, and one

told me not long ago that a female practitioner, supposed to be largely endowed with "natural electricity" (whatever *that* may mean), had treated her tumor with electricity by rubbing nearly all the outer layer of epithelium from her abdomen, and with the temporary relief which massage sometimes brings. Is it to be wondered at, then, that there are sceptics regarding its use?

Since my appointment as Electro-therapeutist to the Woman's Hospital several years ago, I have had abundant opportunity to test the values of the different methods of application, and have found the results of those cases treated by Apostoli's methods to be far better than the others. Puncture through the abdominal wall seemed to produce fair results in some cases, but I do not consider it as efficacious as Dr. Apostoli's method. Although the *modus operandi* of it is comparatively well known, a hurried description may elucidate much that follows.

He introduces one electrode, shaped like an ordinary uterine sound, into the canal, and the other, a moist pad of potter's clay, is placed upon the abdomen over a prominent nodule, if there be one, or at the upper limit of the growth, if it be rotund. These are then connected with the battery by the flexible conducting cords, one of which must reach the battery by way of the milliamperemeter, as the amount of current used is to be accurately measured. The current is then turned on, its strength increased very slowly and without shock, till the proper number of milliamperes is reached, and is

kept there from five to twenty-five minutes, depending upon the susceptibility of the patient, etc., and is then reduced in the same way, great care being taken to avoid any sudden break in the current, which would cause a shock to the patient. This method will answer for most cases in which the mass is situated in, or attached to, the fundus or anterior wall; should the situation or attachment be the posterior wall, galvano-puncture is resorted to, with a trocar-pointed electrode. Its application is as follows: A careful vaginal examination is made, and the posterior cul-de-sac thoroughly explored, any pulsating point being located, and avoided thereafter. When a spot free from pulsation is found, the end of a small celluloid tube is placed against it and the trocar-electrode, with the handle firmly screwed to the end toward the operator, is passed through the celluloid sheath and the puncture made to a depth not exceeding one to two centimetres. This celluloid tube answers a double purpose: that of insulating the needle from the vagina and of preventing the point from entering too far or beyond the distance intended and previously arranged for. Should much hæmorrhage occur when the needle is withdrawn, an accident I have never known to happen, a bivalve speculum can be introduced and forceps applied, or the positive pole be made to act as a hæmostatic.

This treatment is often administered without an anæsthetic, and the strength of the current should be no more than the patient can tolerate. It should

also be remembered that the current itself, in two or three moments, has a distinct local anæsthetic effect, thereby lessening the pain and allowing an increase of quantity. A current of 30 milliampères has been found to produce benefit, and up to a certain point, stronger ones in proportion. I find that from 75 to 150 milliampères can be quite comfortably borne, and certainly produces most marked improvement.

While trying to get exact measurements of the tumor in every case, it is often extremely difficult to do so, owing to the presence of gas in the intestine behind the mass, to the thickness of the abdominal walls, etc. One thing that I have noticed is misleading, viz., that in some cases which have been treated by this method, as the tumor diminishes in size an increased amount of adipose tissue is found in the abdominal wall. This point should not be overlooked when external measurements are taken for comparison with former ones.

The *proper* use of the poles is of the greatest importance. To make a definite rule as to which should be used internally is impossible, as the nature of the symptoms will be our guide. In the class of non-bleeding fibroids, the *negative* pole is indicated for two reasons: first, because it seems to curtail the supplementary circulation by means of the rapid atrophy it causes, especially where puncture is made, and, second, because Dr. Apostoli has found that in bringing about a reduction of the mass, it is quicker. For the treatment of bleeding fibroids, the hæmo-static action of the positive pole has been too well

proven to require extended notice. Not one single case of this kind which I have treated by the Apostoli method has failed to give the greatest satisfaction to both patient and myself. Cases have come to me nearly exsanguinated, and I have managed by this means not only to stop the hemorrhage, but, to my delight, prevent its return. Surely, had the treatment no other merits, this one in itself would entitle it to a fair trial before operative procedure is resorted to.

It is not my intention to claim any more than can be proved by many who are using it to-day, nor that a few applications of it will cure any and every fibroid with which it is possible for one to meet. That it is slow in its effects I know, and we must not be disappointed if marked diminution in the size of the mass is not noticed at once. The great majority of cases show little change under a month of treatment, which should be applied three times weekly. But I have found one (very rarely, two) thorough applications quite sufficient to control the most obstinate hemorrhage, provided a sufficiently strong current is used, and, what is *most* important, that every part of the endometrium be brought in contact with the electrode. This is sometimes very difficult, as the canal may be tortuous, and the stiff electrode then fails to touch some spot where there is bleeding. This may be provided for by the use of a flexible electrode, which is insulated to its platinum tip, which latter should be three-fourths of an inch long and shaped like a probe, but of

larger calibre. Having passed it to the entire depth of the uterus, it is held there, with one finger against the os, long enough to cauterize the parts in contact with the tip (the time to depend upon the strength of the current used), then gradually withdrawn, a very little at a time, till the entire endometrium has been cauterized. Should there be fungoid growths present, causing some if not all of the hæmorrhage, they will be destroyed at the same time, thus answering the purpose of curetting, and without leaving a fresh bleeding surface within the uterus.

All these measures should be carried out in a rigidly antiseptic manner, washing out the vagina with a bichloride or carbolic solution, before and after each application, and immersing the intra-uterine electrode in a saturated solution of iodoform in ether, just before introducing it. The ether instantly evaporates, leaving a thin deposit of iodoform on the electrode. Should germs even then be present, the current will be more than sufficient to destroy all life in them.

No new method of treatment is brought before the profession without its detractors. This I consider most fortunate, as it leads to discussions and narrations of cases which cannot fail to instruct us, and many interesting features are thus developed, which are of the utmost value.

One of the objections raised to the employment of the Apostoli method is the danger of a current strong enough to produce beneficial results. *Improperly* used, I grant that damage may be done;

34 ELECTRICITY IN GYNECOLOGY.

but does a badly managed case of hysterectomy always get well? I would ask those who have made this objection to compare the results of the laparotomists with those who have treated an equal number of cases by this method; the latter will be found much less dangerous to the lives of the patients, to say nothing of the long convalescence, pain, possible mania, inability to continue in daily avocations, and hæmorrhage during or after the operation. The experience of such well-known gynecologists and authorities as the Keiths, father and son, Sir Spencer Wells, Woodham Webb, Playfair, and others in Great Britain alone, must certainly silence many objections regarding its inutility, while in this country, men of undoubted ability have met with results far beyond their expectations. Often the patients themselves can judge of their improvement quite as well as the attending gynecologist, for who knows better than they that the pain and sense of pressure, the dreaded hæmorrhage, the headache and backache so constant, as well as other reflex symptoms, are not what they once were? Who can tell better of the apparent loosening of the waistbands attached to their clothing?

I have now under my care a case sent me by Dr. T. Gaillard Thomas, through whose courtesy I am enabled to report it:

The patient was first seen by me in February of this year, and her history revealed the fact that she had noticed the enlargement in her abdomen four years ago; she had all the usual symptoms, includ-

ing several most severe hæmorrhages, each of which had left her nearly bloodless. She was emaciated to an alarming extent, her pulse was weak, and she felt perfectly certain that the next hæmorrhage would be her last, and that she could not recover from the effects of a hysterectomy. Her tumor was situated in the fundus, and extended to the ensiform cartilage; her waist measured forty-four inches in circumference, and examination revealed that her uterus was five and one-half inches deep. Fortunately the canal was straight, so I had little difficulty in introducing the electrode, and thoroughly cauterizing the endometrium. I began treatment at once, and continued it with two intermissions of two weeks each, when she was obliged to leave town, and also during her menstrual periods, till my departure for Europe, the last of June, and did not see her again till on my return, October 1st. She has had no renewal of hæmorrhage; her tumor is now down to the umbilicus; is not tender, and gives her no pain; the canal is three and one-fourth inches long, and she can walk to my office, nine blocks from her home, three times weekly for her treatment, and can undergo the fatigue of a day's shopping with only a moderate amount of discomfort.

I could occupy the reader's attention with the narration of other cases were it advisable; but I feel that I cannot close this paper, already too long, without reference to an article written by Dr. Thomas Keith, of London, and published in the *British Medical Journal* of June 8, 1889. In it he says:

"What I now plead for is, that for a time all bloody operations for the treatment of uterine fibroids should cease, and that Dr. Apostoli's treatment, *as practised by him* [the italics are mine], should have a fair trial. Those who have hitherto most resisted the introduction of electricity are the surgeons who are best competent to carry it out. They are accustomed to manipulate in the pelvis, and they will not make mistakes of diagnosis, or make them as seldom as it is possible to do. Hysterectomy, remember, which is performed every day for a complaint that rarely of itself shortens life, kills every fourth or fifth woman who is subjected to it. This mortality must cease; it is not a question of surgery, it is a question of humanity. Every time that any disease can be cured without resorting to a bloody and dangerous operation, such as hysterectomy, progress is made in our art, and there is a gain to humanity, while surgery is the better for being purged of a deadly operation." . . .

"It may seem strange to some, that after the results I got in hysterectomy—results which almost make it justifiable—I should now begin to throw stones at the operation, instead of trying still further to improve upon it; and but for Dr. Apostoli, I should now be doing so. I would give something to have back again those sixty-four women that I did hysterectomy for, that I might have a trial of Dr. Apostoli's method upon them; and I would give something never to have had the tear and wear of flesh and spirit that these operations cost me, for in scarcely one of them was the operation simple.

"I have, in the meantime, said my say, and it must not be forgotten that the opinion here expressed as to the value of Dr. Apostoli's treatment is not that of an unsuccessful surgeon, but is the deliberate opinion of one who was the first to lower to a minimum the mortality that so long followed abdominal surgery, and who, by the best results yet obtained in hysterectomy—results that Dr. Playfair is pleased to call almost phenomenal—still retains that position."

What can I add after such an opinion as the foregoing? I can simply say that my experience with Dr. Apostoli's methods, while large, is more than satisfactory, and in quoting Dr. Keith's praise and thorough indorsement of it I have expressed my own views.

While abroad on business last summer, I was enabled to visit Dr. Apostoli's clinic and to satisfy myself on many points regarding his histories and statistics, and I earnestly advise all who can possibly make an opportunity, to see him at his work in the Rue du Jour, to do so.

You will be welcomed by a most charming and courteous gentleman, who will give you every possible opportunity not only to see him operate, but to examine his cases and their histories, talk with them, ask them any questions regarding their condition and treatment that you may see fit, and, in fact, satisfy yourself on every possible point of the truth of his assertions and the merits of his methods. You will also meet colleagues from Germany, Russia, Scandinavia, and the South of Europe, as well as many English surgeons of renown, a few South Americans, and, I am proud to say, a goodly number of our own countrymen; and nearly all have the same opinion as to the merits of Dr. Apostoli's treatment, and seek his clinic for further instruction.

In conclusion, let me urge upon the reader to give this method a *proper* and *thorough* trial before rushing his afflicted patient to the operating-room, there to undergo the dangers of the knife.

**NOTES ON THE TREATMENT OF FIBRO-
MYOMATA BY ELECTRICITY.**

BY A. H. BUCKMASTER, M.D.,

ASSISTANT SURGEON TO ST. PETER'S HOSPITAL, BROOKLYN, N. Y.

THIS method of treatment has been before the profession for several years, and, while the consensus of opinion is decidedly in its favor, there are many who are disposed to deny its efficacy. The treatment requires patience, it is slow, and in cases where the tumor is treated solely on account of its size it is often impossible to gauge accurately slight variations. Constipation, flatulence, increase in adipose tissue, congestion or œdema, all are apt to mislead and perplex the observer. There are several means by which the sceptical may become convinced that the treatment is valuable.

First. By statements of individual observers, many of whom have not only claimed relief from symptoms and decrease in size, but also total disappearance of myomatous masses. The evidence of this class is most abundant.

Second. The testimony of individuals supported by the observations of disinterested witnesses. This can best be obtained in the hospitals, and a com-

petent man should be invited to test the cases, who should be a thoroughly practical gynecologist as well as an electrician, and competent to recognize the contra-indications for treatment.

Third. The presentation of a reasonable explanation of the means by which the results are obtained. The explanation of the writer is founded on experiments on the non-striated muscular tissue of the dog's heart and on fibroid tissue outside of the body. The experiments were as follows :

The heart of an anæsthetized dog was exposed and a current of forty milliampères made to traverse a portion of the ventricle. A piece of the ventricle in the direct line of the current was excised and another some little distance from the direct influence of the current. When examined under the microscope the piece from the direct line of the current showed that the striæ had become markedly granular, while the piece outside of the direct line of current preserved the muscle cells unaltered. This granular appearance of the striæ would indicate degeneration of the muscle bundles. It is observed in fatty degeneration, and in such cases the contractility is much impaired. This is the first evidence of absolute molecular disintegration of living cells by the interpolar action of the galvanic current, where such process is confined to the cells.

The condition of rigor mortis is readily induced in a muscle through which circulation is maintained. The action of heat at 118° F., distilled water, acids even of the weaker kind, such as carbonic acid, bring

it about. If death rigor occurred in any considerable part of the muscle tubes of the tumor there would result a marked diminution of its irritability, for it is a well-known fact that muscle under this condition ceases to respond to stimuli. To determine if this was so after treatment the following experiment was resorted to:

It is assumed that the contractions of the uterus are followed by contractions of the vagina which are in direct proportion to them. Kehrer¹ found in his experiments with rabbits, that exposure to air would give rise to a contraction which advanced through the whole genital canal, while by chemical, mechanical, electric, and thermal irritation contractions could be started at almost any point and were transmitted in one or the other direction, so that an increase in the vaginal pressure would indicate a contracted condition of the uterus. This method of indicating contractions of the uterus has been utilized by Milne Murray,² of Edinburgh, in his experiments on the effects of hot water on the uterus. The following method was adopted by the writer: A rubber bag by which the vaginal pressure is to be determined is filled with water and communicates by a rubber tube with the proximal arm of a U-shaped glass tube which contains mercury. The other arm of the glass tube is opened at the end.

¹ Chadwick: Peristalsis of the Genital Tract. Trans. of Amer. Gyn. Soc., vol. x.

² Edinburgh Med. Journal, Aug. and Sept. 1886.

42 ELECTRICITY IN GYNECOLOGY.

When any pressure is made on the bag the column is pushed back, and this raises the discus of the mercury in the distal arm. The variation can be read by means of a graduated scale. The chief sources of error in using this means of measurement arise from having air mixed with the water, or having the tube of such thin rubber that it readily becomes distended by pressure.

There are two methods of measuring the effects of stimuli on muscular contraction; one is by observing the comparative strength of the contraction, and the other is by ascertaining the smallest amount of current that will give a contraction; the latter method was in this instance adopted. The induced current with a sliding induction coil was used. The cell used was a constant one. The patient in position, the electrode was placed in the uterine canal. The bag filled with water was then introduced, and after waiting five or six minutes for the vagina to become accustomed to it, the faradic current was very gently turned on (the other arrangements being exactly similar to those used in the ordinary treatment) until contractions were induced in the uterus. The amount of this current was carefully calculated. The constant current was now gradually substituted by means of a rheostat until sixty milliampères were registered. In about a minute the column of mercury showed an increased vaginal pressure of one-sixteenth of a pound.

The current was turned off very gradually, and the patient allowed to remain perfectly quiet for

twenty minutes; at the end of this time the slightest induced current that would give a contraction was considerably less than before the treatment.¹

The above experiments only point out a line of investigation. The writer has not had the time to repeat and test them as should be done; he merely indicates from the standpoint of the clinician what the laboratory worker may establish or disprove. So much for the interpolar action. In regard to the action at the poles it must not be forgotten that slight traumatism of the cavity of the uterus has an important effect upon the nutrition of the fibroid, and that there are many cases where fibroids have spontaneously disappeared. Gusserow states that various operative procedures, sponge-tents, incision of the mouth of the uterus, and intra-uterine injections frequently cause sloughing of fibro-miomata by interference with nutrition from traumatism of the uterine mucous membrane.

It is not my intention to narrate the histories of my cases, which present nothing brilliant in the way of cure. In no case has there been lack of improvement, in no case have I seen disappearance of the fibroid.

In regard to the technique of the operation there has been but little improvement of late. The literature of the subject is, and has been, overburdened with descriptions of visits to Apostoli and of his methods. A thorough knowledge of French is

¹ Unfortunately the writer has been unable to repeat this experiment, but hopes that others may do so.

44 ELECTRICITY IN GYNECOLOGY.

necessary to form any adequate personal opinion of Dr. Apostoli's work, or to comprehend the statements of patients, and this requisite must present an insurmountable difficulty to many of these witnesses.

To Dr. Austin Goelet, of this city, is due a cheap and efficient electrode with which many electricians are familiar. One fact has, I believe, escaped attention in stating the dangers incident to these cases, and that is, chronic renal disease. Not only should the urine *in all cases* be examined for albumin, but the amount and specific gravity should be carefully considered. The writer has seen this complication assume most serious importance, and it should never be overlooked. In closing these brief remarks I desire to say that I believe that dissatisfaction in the treatment is usually due to failure in understanding and carrying out the principles enunciated by Apostoli.

207 CLINTON STREET, BROOKLYN.

BI-POLAR FARADIZATION IN GYNECOLOGY.

BY A. LAPTHORN SMITH, B.A., M.D., M.R.C.S. ENG.,
F.O.S. LOND.,

SURGEON TO THE WOMEN'S HOSPITAL AND LECTURER ON GYNECOLOGY
IN THE MEDICAL FACULTY OF BISHOP'S UNIVERSITY, MONTREAL.

ELECTRICITY is such a new subject and its different departments are so numerous that it is no easy matter for all of us to keep pace with its progress.

As is generally known, it was Faraday who discovered that an induced current of electricity is set up in a conducting wire which is placed near to, but not touching, another wire through which a current is passing. It is also well known that the appreciable effects of the passage of a current of electricity, either direct or induced, are greatly increased by the interruption of the current. Thus a continuous current of a hundred milliampères can easily be borne, while if the same current be interrupted it will promptly knock one down. By making the primary wire into the form of a coil and placing a piece of soft iron within the coil the iron becomes magnetic whenever the current passes, and this body of magnetized metal in turn intensifies the current in the primary coil. The primary coil should be made of moderately coarse wire so

as not to offer too great a resistance for the battery to overcome, as the battery, which should consist of two closed cells in a separate portable case, must have sufficient electro-motive force to push through the coil. The secondary or induced coil deserves special attention because it will depend entirely upon the shortness and coarseness, or the length and fineness of the wire, whether you will obtain those almost magical effects which some have claimed for it. There are many who cannot believe that these differences are of any real consequence, and yet there is no fact in medicine of which I am more certain than that the results from these two wires are totally different. The coils which I have been using for the past three years are wound as follows: the short wire coil, which is about twenty-five yards long, and No. 14 or 16 in diameter, is insulated with silk and varnished between the layers. The fine wire is about No. 40, which is the finest made, and is about a mile long. The short, thick wire gives out nearly the whole quantity of current that is induced in it, and is, therefore, called the current of quantity, while the long, fine wire offers a tremendous friction or resistance to the passage of the current, and is, therefore, called the current of tension. I think this is a better name for it than current of *quality*, which it has sometimes been called. The current of quantity from the coarse coil, as has long been known, is an excellent tonic for muscular fibre, and I have used it to advantage in nearly every case in

which the symptoms could be traced to defective muscular contraction. It should be placed high in the list of tonic remedies, although I do not think that it possesses any miraculous virtues which are not possessed to a greater or less extent by gymnastics, regular exercise, strychnine, quinine, ergot, hydrastine, and cold and hot water. This much can be said for it, however, that it is a tonic especially suitable for relaxation of those muscles which, owing to adverse circumstances, cannot be toned up by any or all of the above mentioned means, and, besides, it can be made directly on the muscles or group of muscles which are most at fault. By means of Apostoli's bi-polar electrode it is especially applicable to the muscular organs in the pelvis. For instance, in post-partum hæmorrhage we can surely obtain instant and permanent contraction of the uterus, no matter how exhausted it may be, by introducing the bi-polar electrode and turning on the coarse wire current.

For those obstetricians who are frequently meeting with this accident, a small battery which can be set in action in an instant, might well find a place in the modern obstetric bag. I must confess, however, that I have never put it to this use, for, although I have been looking for a case on which to try it, since I have been giving nature a little more chance I find that relaxation of the uterus is more and more rare. I have had, however, many cases of subinvolution due to the defective contraction of the uterus, accompanied by the usual

symptoms, and they have invariably been promptly relieved, and in a very reasonable time cured, by *séances* with the bi-polar intra-uterine electrode with the current of quantity as strong as the woman could bear it, and lasting ten or fifteen minutes. But it must be remembered that no such gratifying results will be obtained if the enlargement is due to fibrous tissue instead of muscle. Areolar hyperplasia, like fibroid, must be treated by the continuous current. Another class of cases with which I have had very gratifying results are those of deformity and displacement of the uterus, due to relaxation of its walls or of the muscles which hold it in the centre of the pelvis. The presence of strong adhesions, however, binding it down in a wrong shape or position, would diminish the probability, or even preclude the possibility of restoring it to its proper form or position. The cases in which I have been occasionally disappointed, were those in which the muscles of the uterine supports had undergone degeneration so long ago that there seemed to be little or no muscle left to work upon. In such cases I have abandoned this treatment for some more speedy one.

This treatment is not at all applicable to cases of bleeding due to fungous endometritis, or to the presence of retained placental tufts. In those cases it is our manifest duty to remove them with the curette or, in the case of fungosities, to destroy them with the continuous current. The coarse wire faradism, however, is comparatively well known, so I

need say no more about it. The advantages of the bi-polar method are :

First. It is less painful than the old method because it does not require the current to pass through the skin, which is much more sensitive than the vagina.

Second. It is easier to apply because it dispenses with the need of an assistant.

Third. It allows a much stronger current to be tolerated.

Fourth. It is consequently more effective because the higher the intensity of the dose the more marked the effects.

These bi-polar electrodes are made with one pole at the extremity and the other separated from it by an interval of an inch or so of insulating material, so that the current has to go through the tissues to get from one pole to the other. In doing so, it seems to set up circles of induction in the neighboring structures, as proved by the following observation: when the current is started with a moderate strength from the fine wire coil the patient, if asked what she feels, will say that there is a numbness of about the size of a walnut. As you slide the secondary wire over the primary more and more, she will say that the area of numbness has increased to the size of an orange, and finally when the whole strength is on, the numbness will have invaded the whole pelvis, including the area of pain. This can only be accounted for, I think, by the fact that induced currents are set up in the successive layers of

tissue, which in a way take the place of contiguous wires on the telegraph poles. These bi-polar applicators are made of several sizes; two or three for the uterus, varying from the diameter of the uterine probe to that of the ordinary sound; and as in certain cases, such as pregnancy, it may not be desirable to introduce anything into the uterus, there are several sizes made for the vagina. But one uterine and one vaginal electrode are practically all that are required. As a rule, the preference should be given to the intra-uterine applications because they are much more effective than the vaginal ones.

We now turn to a short description of the qualities, indications, and methods of application of the comparatively new, and in its effects almost magical, current from the fine wire. I have already said that it causes very little muscular contraction, but that it has the power of affecting the nervous system. The element of pain plays an important part in the diseases of women and very often exists where no organic lesion can be found. More especially is this the case with ovarian pain, a great many cases of which I have completely cured with less than a dozen applications of the fine wire faradism. How it does this I am unable to say. Apostoli thinks that it sets up vibrations in the nerves, travelling in an opposite direction to the ordinary or painful impulses. Perhaps the current of tension filling the nerve-fibres dams back the painful impulses, or perhaps the vibrations are so rapid that the con-

ducting power of the nerves is temporarily lost ; but I think that Apostoli's explanation is the best.

There are three kinds of cases in which I have found the fine wire bi-polar faradization remarkably beneficial. They are :

First. Ovarian pain where no organic disease could be found. I do not pretend for a moment that it would be of any use in even small ovarian cysts—the sooner they are removed by operation the better. When I see these on our society table I feel no regret that they have been removed ; but when surgeons remove healthy ovaries on account of pain only, I feel sorry that they were not aware how easily that pain could have been relieved by fine wire faradism. The first sitting should last ten, twenty or even thirty minutes, if it is that long before the patient can say that her pain has gone ; it is then well to tell her that she may expect the pain to return after a few hours, but that each day it will stay away longer and longer, until after a variable number of sittings, rarely more than ten, the pain will remain away altogether.

Second. In cases of abdominal pain due to hysteria it acts promptly, not only in rendering the abdomen insensitive to pressure but also in calming the general nervous crisis within a few minutes. This was one of the observations which struck me most at Apostoli's clinic, that women who could scarcely bear to be touched with a feather on the abdomen, could, after five or ten minutes of fine wire faradism in the uterus or even in the vagina,

endure any amount of kneading and punching without the slightest discomfort. In fact, parts which before were hyperæsthetic had now become anæsthetic. This has caused the charge against Apostoli of curing such cases by means of hypnotism, but I feel sure that this is not the case, because he does not possess that strange power, and besides many of the patients were totally ignorant of the nature of the treatment and its effects. This tolerance of hysterical patients for the full strength of the current of tension has often made me think that my apparatus was not working, until I attempted to test it on my own hand, when I found it unendurable with one-fourth of the intensity which the patient could easily bear. On trying the same strength on well women you will also find that they cannot stand a quarter of the dose that an hysterical woman can.

As I have already said, the current must be increased gradually in all cases, but *very* gradually when the pain is of an inflammatory nature. In bringing an application to an end, it is necessary to turn the current off before withdrawing the electrode, for the simple reason that the passage of the current over the much more sensitive vulva would cause the patient to shriek, although she could bear the same amount of current in the uterus or vagina without feeling it.

Third. There are many women about the age of thirty who, though fleshy and apparently well supplied with blood, do not menstruate at all, or but

slightly. These women feel uncomfortable; their *embonpoint* makes them weak and they have many nervous symptoms which place them in the category of hypochondriacs. Anything that will bring on a full return of the menstrual flow gives them immense relief. I know of nothing that will attain this object more surely than three applications a week of the current of tension to the inside of the uterus, between the periods. Not only will the flow be re-established, but the uterus, which before measured less than normal, will soon develop to its full size. I am aware that there are other means of doing the same thing, but none of them is so satisfactory as this.

Fourth. In vaginismus I have found it remarkably effective. The condition is due to hyperæsthesia of the nerve terminals about the entrance of the vagina, and is really a form of hysteria. In most cases the other symptoms of hysteria, as abdominal tenderness, etc., are present. In such a case the treatment may begin with one or two vaginal applications, after which it will be easy to introduce the finger and to use the intra-uterine electrode. In some cases the hyperæsthesia may be concentrated upon or limited to a small area as large as a ten-cent piece. The removal of the over-sensitive nerves has been recommended by Hilton for this often very intractable condition. Apostoli has devised an electrode for such cases in which the two poles terminate in two hemispheres of carbon placed side by side and separated by a thin layer of gutta

percha. When this is placed on the hyperæsthetic spot the fine wire current is forced to pass through the tissues in order to get from one pole to the other. With this instrument the current can be localized on two or three over-sensitive papillæ. In the worst case of vaginismus I have had in twelve years the patient was cured by three applications and became pregnant at the next ovulation.

Besides these four indications Apostoli has advocated a fifth, with which I have had no experience, viz.: in pelvic pain due to inflammatory conditions of the uterus or its appendages. I have feared so to use it because of its well-known stimulating effects, although it is true that iodine acts in the same way in similar conditions. Those who wish to try it will do well to remember Apostoli's warning not to push the strength of the application beyond the point which can be easily borne, while, on the other hand, in pelvic pain of non-inflammatory or hysterical nature it is sometimes an advantage to push the current rapidly until its full strength is turned on.

There are also some troublesome conditions of the bladder in which I have used bi-polar faradism with advantage, but which I have not the space to describe.

Before closing, I wish to disclaim any intention of considering bi-polar faradism as the only remedy in gynecology. Many of the conditions which we are called upon to treat are the natural outcome of wilful or ignorant disobedience of the laws of health,

and bi-polar faradism will not allow women to break them with impunity. Neither should we forget that the genital organs are not the only organs woman has, so that while we are calming her pain with electricity we should at the same time be removing the unhealthy conditions of the body generally, on which often the local disorder depends. All that I do claim for it is that it is a valuable addition to our therapeutic resources, especially in those diseases of women in which other methods of treatment often fail.

**REMARKS ON ELECTRICITY IN GYNECOLOGY
AND A NEW PORTABLE GALVANIC BATTERY.**

BY FRANKLIN H. MARTIN, M.D.,
OF CHICAGO.

APOSTOLI'S method, which was promulgated less than three years ago, first astonished, then excited the admiration of the entire medical world. Astonishment was expressed at a method which recommended such extraordinary means, and which claimed such brilliant results. Admiration was excited by the brilliancy of the author's conception and the thoroughly scientific grounds upon which it was based.

The instruments of precision introduced and made necessary by Apostoli's method have enabled us not only to prove or verify the value of his work and to substantiate his startling assertions, but to go on applying the sound principles he has evolved to the relief of many pathological conditions peculiar to the female pelvis.

One of the most important points to settle after the introduction of the high dosage system of treatment was the question of generation of current. We were aware that the ordinary batteries in use

would give a maximum current strength through the body, from hand to hand, of but from eight to ten milliampères. Certainly, then (forgetting in practice what we only know in theory), we could not expect to get 300 milliampères with the same instruments. We soon found, however, from practical experience, that we were mistaken and that the battery which gave a current of but eight or ten milliampères through the enormous resistance of the body from hand to hand, would give a marvellously strong one through the comparatively small resistance offered by the abdominal walls and pelvic tissue, with properly constructed electrodes. We now know that the resistance offered by these parts with the clay, or some form of substitute for the clay electrode, is less than 200 ohms instead of 2000, as was originally supposed.

Any battery may be used which will give a maximum electro-motive force of fifty volts, with but small internal resistance, which is without vibration, undulation, or interruption, which can be perfectly controlled by the operator, and which can be gradually increased from zero to its maximum strength, and the reverse, without interruption. This includes the ordinary open circuit battery cells employed for office purposes, ranging in number from thirty-six to fifty—according to their electro-motive force. The Leclanché, the Law, and the Diamond Carbon are usually preferred. For all work, except when puncture is required with small exposure of needle surface (thereby increasing the resistance) or

when extraordinary strength of current is required, the ordinary twenty-four to thirty cell zinc and carbon chromate of potash batteries, such as are manufactured by the Galvano-Faradic Battery Co., the Flemming, or the McIntosh Battery Co., are sufficient. My battery is the outcome of a series of experiments made with the end in view of bringing forth a small portable battery which would possess none of the objectionable features of the ordinary form and which would do the same amount of work as that required of the office stationary battery.

The cell is a form of the chloride of silver cell, of sufficient power to give an electro-motive force of one volt, and an ampère of $\frac{8}{10}$ ampère. So that a battery of fifty cells will do the same amount of work as thirty-six to forty Leclanché cells. A battery of thirty-five of these cells has done all of my outside work for a period of eight months, without change or renewal, and possesses greater working power to-day, because of decrease of its own internal resistance, than when I began. From experiments made with the battery it is estimated that it will run with ordinary use without recharging or without perceptible deterioration in strength from one and a half to two years. As the battery is free from action when not working, it will remain in active condition a length of time in direct proportion to the amount of work required of it. There are two sizes of this battery manufactured by the McIntosh Battery Co., of Chicago, one of thirty-five cells and one of fifty cells. The fifty

cell battery will generate a current of 300 milliamperes with the Apostoli electrodes or any of the approved modifications.

Next to the treatment of fibroid tumors of the uterus by galvanism, I have found the greatest satisfaction in treating inflammatory exudation in the pelvis. This includes all cases, from the simple thickening of one or both broad ligaments to complete fixation of all the organs of the pelvis, with a thick unyielding exudate matting everything together. All acute inflammation, except secondary points arising from the irritation of already hardened exudate, should have disappeared in these cases before treatment is instituted.

I speak advisedly, after a long experience with a large number of such cases, when I say that I do not believe that there is a case of the kind described which, if submitted to a persistent course of applications of strong doses of galvanism in the proper manner, cannot be cured. The exudate will gradually but perceptibly disappear, the pain from pressure upon nerve fibres and nerve points will rapidly diminish, sympathetic disturbances will be relieved, displacements caused by contracting bands will gradually give way, and the general mobility of the pelvic organs will return, while coincidentally the general health is restored from the effect of the electricity on the general system.

The best results are obtained in these cases from comparatively strong doses of from 75 to 125 milliamperes. The object must be, in applying the

electrodes, to include between them, as far as possible, the area of greatest disease. This, occasionally, will admit the use of an intra-uterine electrode as the internal point of departure. When an intra-uterine electrode is employed, one of as large surface as practicable should be selected, to avoid undue concentration and cauterization, which would give rise to subsequent cicatricial contraction. In the majority of these cases, however, an intra-uterine electrode is not admissible because of the position of the exudate. In such cases it is necessary to employ a vaginal electrode so constructed that a thorough diffusion of the current is obtained, in order not to cauterize the mucous membrane of the vagina. For that purpose I employ an electrode composed of a slightly curved, insulated staff terminating in an exposed metal ball which is thickly covered with absorbent cotton moistened with water. By this simple instrument I can select any particular portion of the vagina required, with a soft yielding contact surface and thorough diffusion. The cotton is applied to the instrument by folding a thick piece over the metal bulb, and fastening it around the staff at its point of attachment with the metal by means of a small rubber band.

This instrument can be inserted with or without a speculum—more easily without, with the patient upon her back and the hips drawn near the edge of the bed or table. If a speculum is used, it should, of course, be withdrawn before the treatment is commenced. When the internal electrode is in place,

62 ELECTRICITY IN GYNECOLOGY.

it should be attached to the negative pole of the battery. Having previously adjusted the external abdominal electrode and attached it to the positive pole, the current should be gradually turned on, employing every precaution to prevent the slightest break or shock, until a strength of from 75 to 125 milliampères has been reached, the maximum strength tolerated varying between these figures with the varying sensibility of patients. The sitting should last from five to eight minutes, when the current should be gradually reduced to zero and the instrument removed. The treatment should be given every second day. The staff of the electrode is easily unloaded of its cotton by means of the dressing forceps, thus making it possible to observe perfect cleanliness. Cleansing the staff thoroughly, and the use of a fresh covering and fastening each time, of course, being imperative.

This treatment persistently carried out will accomplish exactly what I claim for it. It will not only absorb the slight exudations which merely produce thickening of the vaginal vault, but it will cause the rapid disappearance of large, well-defined masses situated in the broad ligaments or in Douglas's cul-de-sac. It will cause ovaries, large and tender from the irritation of inflammatory products, to assume their normal condition by removing the cause of the trouble. It will cause the disappearance of strong bands of adhesion, no matter where situated.

It has long been known that *mild* currents, per-

sisted in for a long time, would slowly cause disappearance of superficial exudates, but it hardly held its own with the old treatment of iodine applications and the glycerin plug, owing to the time and cumbersome apparatus required. But a cumbersome apparatus *alone* is no longer a sufficient excuse to justify us in ignoring the rapid and complete results obtained with *strong* doses, and the other advantages offered by Apostoli's instruments of precision.

I am aware that many assertions of a fact do not carry the weight of a recitation of a series of well-authenticated cases possessing evidences of conscientious reporting and of independent verification. I can only say in self-defence, that I have a series of just such cases in preparation for publication, in which the diagnosis and, afterward, the results were verified in almost every instance by eminent gynecologists.

My experience in the treatment of fibroid growths of the uterus by electricity amounts, in round numbers, to two hundred cases. In that number of cases, not more than five failed to continue the treatment until results could be estimated. Of those who continued treatment and made a fair test of its value, up to the present time but three have failed to obtain relief. One of these was a large, soft, spongy, rapidly growing subperitoneal growth, with a suspicion of malignancy, in a patient who was so sensitive to the treatment as to be unable to receive a satisfactory dose. The second was a marked hæmorrhagic case of a submucous variety, composed

of many centres of development, which repeatedly discharged itself in small masses from the uterine canal, until finally the patient became discouraged and ceased treatment. The third case which I have been unable to influence favorably is one of a large, regular subperitoneal variety, which I have persistently labored with by means of the vaginal galvano-puncture with remarkably strong doses. I am unable to account for the stubbornness exhibited in this latter case, and shall recommend surgical interference.

I am fortunate, considering the great number and variety of cases treated, to be able to record no deaths; my results, on the whole, have been exceedingly gratifying. About eighty-four per cent. are symptomatically cured, with an additional per cent. of actual cures. About fifteen cases are still under treatment.

My methods, except in unimportant minor details, are in direct imitation of my friend and master, Apostoli.

There were two varieties of cases that gave me a great deal of perplexity in my earlier work, because I could not find their counterpart in Apostoli's publications. The first was a large interstitial variety of fibroid with a marked hæmorrhagic tendency, in which the patient would not tolerate a strong dose. In these cases the uterine canal is of great depth, and the hæmorrhagic surface of necessity very extensive. In order to check hæmorrhage in such a case, a strong dose is imperative, unless some means

of concentration is employed. Of course, if the ordinary platinum sound electrode is employed, of sufficient diameter and length to cover the whole internal surface of the uterine canal, a current of enormous strength must be employed to get sufficient concentration at any given point to cause coagulation and change of tissue, so as to check hæmorrhage. In other words, a certain intensity is required, and the intensity is in direct proportion to the strength of the current and in inverse proportion to the area of the electrode. As it was impracticable to employ a dose of more than from 100 to 200 milliampères in many cases, on account of peculiar sensitiveness, I devised a means of internal concentration, or of limiting the area of the electrode.

A series of experiments, which I have already mentioned in an article read three years ago at the International Congress, proved that a current of twenty-five milliampères was necessary on an average for each square centimetre of internal surface, exclusive of the positive platinum electrode, in order to accomplish coagulation sufficient to check hæmorrhage. Upon that basis I constructed electrodes with a surface of four square centimetres, by means of which definite results were assured, and with which it was unnecessary to employ more than 100 milliampères current, different portions of the canal being treated in turn, at successive applications, until in time all have been covered. These electrodes are easily cleansed by means of a nail-brush and are constructed so that they will not be

injured by strong antiseptics. Their flexibility alone is a great recommendation.

The other class of cases fortunately comprises but a small per cent. of all. They are distinguished by great sensitiveness and profuse hæmorrhage at the menstrual period. They tolerate but a small current and are even severely prostrated by the small dose they are able to bear. These cases, of course, cannot be expected to improve unless they are enabled to take a decided dose, and the nervous prostration is so severe when such a dose is forced upon them that it renders the treatment intolerable. A marked hysterical element is often present in these cases. The subsequent prostration is produced no doubt by strong reflex disturbances. I have found that they are readily improved if means are adopted by which powerful doses can be administered at not too frequent intervals, and at the patient's room where she need not be disturbed for six hours following treatment. I, therefore, get the dimensions of the uterine canal, and an electrode is constructed to fit it. I estimate its surface area in square centimetres, and estimate the strength of the current at twenty-five milliampères per centimetre that will be required at each sitting. I then order the patient to repair to her bed one hour before treatment, and to take a full dose of morphine and atropine. If I find, upon turning on the current, the patient will not tolerate the dose required, I ask an assistant to saturate a handkerchief with chloroform and give the patient just sufficient to enable

me to attain my object. When that has been reached, the chloroform can be withdrawn, the patient usually being able to stand the electricity after it has once reached its maximum strength. The current is then allowed to operate for ten minutes at the full strength required, when it is gradually withdrawn, and the patient instructed to remain quiet for at least six hours.

If it is not deemed prudent to give the opiate, chloroform alone, of course, can be employed; but I employ the opiate because, as a rule, the patient requires nothing more.

By this method I have repeatedly given doses varying in strength from 200 to 400 milliamperes, and prostration seldom follows. The dose is repeated in from six to ten days.

**THE TREATMENT OF CHRONIC METRITIS WITH
GALVANO-CHEMICAL CAUTERIZATION.**

BY G. BETTON MASSEY, M.D.,
OF PHILADELPHIA.

IN regard to this new electrical treatment of the diseases of women, I am of the opinion that a forward movement of vast importance has been initiated. So positive and striking is this progress that a degeneration into a fad is to be feared; but the fear of this should not blind us to important facts. During the last few years electrical science has itself been revolutionized, and it would be strange indeed if our better knowledge of it did not lead to the better application of this force to the medical arts.

Most authors have referred but little to one class of conditions in which I regard the galvanic current as possessed of an unique value. I allude to chronic inflammation of the uterus or of the endometrium. Theoretically, nothing could be better. In a convenient, clean, and controllable form we have an agent that will act as an alterative to the diseased membrane, and at the same time reduce interstitial hypertrophy by promoting both absorp-

tion and contraction. What other remedy promises as much?

In practice I have found that facts coincide very closely with this theory. I will give several brief illustrations:

A young married woman had been ill two and a half years, dating from a miscarriage. The symptoms were those of a chronic metritis with copious leucorrhœa from a capacious cavity three inches in depth. Fifty milliamperes negative were applied intra-uterine for three minutes. Three days later she was better than for many months. After a second application the cavity decreased to the normal depth, and after a third she was completely cured.

Another case was that of a lady, aged thirty-one, who had been suffering from leucorrhœa and pain since a miscarriage, two years before. Examination showed a slightly lacerated os and a hypertrophied uterus pouring forth an abundant purulent discharge from a three-inch cavity. Two intra-uterine negative and one positive cauterization were given with a current of fifty milliamperes, resulting in a prompt and complete cure.

Another case presented symptoms of both chronic metritis and parametritis. This woman was seen at the Howard Hospital Clinic in September last, with the ordinary symptoms of chronic metritis dating back three years to a miscarriage. The uterus was enlarged and indurated with a three and a half inch cavity and a peculiar hypertrophy of the anterior

lip. There were also decided fixation and tenderness on the right. She was given four intra-uterine cauterizations varying in strength from fifteen to forty milliamperes. The result was a reduction of the cavity to two and a half inches plus, and the complete disappearance of a host of annoying symptoms.

In simple endometritis or uterine catarrh, galvanic currents locally applied are practically infallible. I have never seen a case resist them. The current strength need not exceed ten to thirty-five milliamperes, using the bare intra-uterine electrode and an external indifferent pole of proper size. The choice of pole is governed by the presence or absence of menorrhagia, the positive pole being always used with this complication. When the endometritis is associated with slight cervical lacerations, it will usually be found unnecessary to perform the operation for repair, as all symptoms disappear under this treatment, leaving the patient practically well, even though a slight irregularity in the cervix remains.

**REMARKS UPON THE USE OF ELECTRICITY IN
THE TREATMENT OF FIBROID TUMORS OF
THE UTERUS.**

By ALEXANDER J. C. SKENE, M.D.,
OF BROOKLYN, NEW YORK.

IN estimating the value of electricity in the treatment of fibromata I have, of necessity, been guided by the opinions of others more than by my own observations. Owing to the extremely conflicting testimony of those who have expressed themselves, it has been very difficult to get at anything definite.

One class of men has condemned this treatment without mercy. Another class has obtained the most perfect results—all that could be desired, in fact—and still another class has had an intermediate experience. They have been able to relieve their patients of most or all of their symptoms, and have diminished the size of the tumors or retarded their growth.

I have accepted the testimony of this latter class of witnesses because it apparently contained the most truth, and also because it agreed with what little experience I have had in my own practice. More than that, I have observed that those who

avoid the extremes of praise and condemnation are gaining in numbers.

Time will not permit a full review of the arguments employed by those who are opposed to this treatment of fibromata, but it may be said that the strongest opponents are those who know least about electro-physics and the therapeutic use of electricity. They have not thoroughly tried it in practice, but have theorized about it and insisted that from the nature of electricity it could not affect neoplasms, forgetting that, in this, electricity is like many other therapeutic agents which produce most valuable effects, while we do not know how such effects are produced.

It has also been claimed that this agent is dangerous, but that has been fully met by the fact that all the benefit can be obtained without taking the risks that were at one time supposed to be unavoidable.

Scoffing and ridicule have been indulged in by a few, but they are signs of weakness in those who indulge in such methods of wrestling with questions in science, and may be passed without notice.

Perhaps the most important question in the whole discussion is the relative merits of this and other methods of treatment. The claims of hysterectomy and the removal of the ovaries for fibromata have been urged with great vigor by those who are strongly addicted to surgery. There is, however, no evidence that this kind of surgery is safer or surer in its results than electricity.

By a curious misuse of facts, it has been made to

appear that surgical treatment has advantages which it does not possess. Many cases are reported cured when they are simply relieved from the immediate effects of the fibroma and when, in fact, they are in worse health than before the operation.

I have tried to get records to show that more cases have died from removal of the uterus and ovaries for the cure of fibromata than have died from fibromata without treatment of any kind. If such are the facts—and I believe that the records of New York and Brooklyn would show them to be—surely surgery does not compare favorably with electro-therapeutics.

Add to this the cases that suffer ill-health after losing the ovaries and uterus, and the records of surgical treatment are not very largely in the interest of patients, though they may be in the interest of surgeons.

Certainly, the claims of electro-therapeutics are too well sustained to be put aside by any adverse arguments which have been advanced. In fact, the record of the treatment of uterine fibromata by electricity is remarkably good considering the short time that it has been properly used, and this leads to the hope that when it is better understood and more wisely employed it will gain more confidence.

Up to the present time it has, in its immature state, been competing with surgery, which has had the advantages of being perfected by long experience.

Great progress has been made within a short time. In a recent discussion in the Academy of Medicine

76 ELECTRICITY IN GYNECOLOGY.

of Paris it was shown that strong currents are not necessary; neither is it necessary to puncture the tumor in order to get good results. This enables us to avoid all dangers, hence is a great improvement in the art.

The science of electro-therapeutics has also been advanced greatly by the discovery of the action of the electric current upon tissue, as demonstrated by Dr. Buckmaster and confirmed by Dr. Van Cott, a demonstration which ought to silence all who have argued that such effects were impossible.

DISCUSSION

ON THE USE OF ELECTRICITY IN GYNECOLOGY.

In the discussion which followed the reading of these papers:

DR. P. F. MUNDÉ, of New York, said that for a number of years he had been much interested in this subject of electrical treatment, and believed he had had ample opportunity to become acquainted with its practical working. He could speak most decidedly in favor of electricity as a therapeutical agent in gynecology, and had published his views on this subject in an elaborate article several years ago. He had seen more benefit derived from galvanism than faradism in gynecological practice. He had also found that mild currents used for a long time are, as a rule, more efficacious than strong currents employed for a short time. He used a Leclanché forty-cell battery. For ordinary purposes he used a small meter registering only twenty milliamperes. He had another which registered 500 milliamperes. This he had used a few days ago in treating a fibroid, and had found it faulty and untrustworthy.

With galvanism, placing the positive electrode next to the sensitive part in the pelvis, or on the abdominal wall, he had obtained excellent results in relieving the pain of chronic pelvic peritonitis. In old cases of inflammation with adhesions, with more or less pain in the ovaries and tubes, he had found that the tri-weekly administration of electricity, with the positive current

internally, was a decided benefit after a few months of treatment. On the other hand, a number of patients, after several months of such treatment, had received no appreciable benefit whatever, and laparotomy had to be performed. This showed that electrical treatment was not suited to these particular cases. However, he deemed it proper in all circumstances to give patients every opportunity for possible benefit from electricity before subjecting them to a radical operation which, by whoever performed, could never be without an element of danger.

In obscure pelvic pain, due to an inflammatory deposit unrecognizable by digital examination, extending down the sciatic or crural nerves, he had seen instant relief follow the use of electricity after other treatment had failed. While he relied on electricity, and had found it of great benefit, especially in relieving pain, he thought it might be carried too far. He considered the length of time necessary to achieve satisfactory results was a great drawback to the use of electricity. If it was clear, however, that some good was being done, the time was, of course, not lost.

As to the milliampèremeter, though he had two, he was by no means satisfied that it was at all necessary, and was inclined to look upon it as a sort of plaything. When using galvanism for the relief of pain, the sensations of the patient, he thought, were a sufficient guide as to the strength of current to be employed; but when using the current in anesthetized patients or for galvanopuncture, it was necessary to know exactly the strength.

The faradic current he had found very useful in amenorrhœa, intra-uterine faradization being employed three times a week for this purpose. He had used electricity but once in extra-uterine pregnancy, the interrupted galvanic current being the one employed. He

had cured the patient, after nearly killing her by the shock. In pyosalpinx and pelvic abscess, laparotomy and drainage were certainly to be preferred to galvano-puncture. As to uterine fibroids, he had very decided views. He considered that the value of operative treatment in this class of cases was over-estimated. Out of 123 cases coming under his observation, about 50 per cent. had required no treatment whatever. 62 had required treatment, but only 8 of this number, in his opinion, had required Apostoli's method, and 4 others called for galvano-puncture. Apostoli's plan of treatment covered only the intra-uterine use of galvanism, with the clay electrode on the abdomen, the galvano-puncture being not strictly his method.

He had used the Apostoli treatment eight times in three years, and he could honestly say that while he believed it efficient for the removal of pain and the checking of hæmorrhage, and admitted that the patients felt better for its use, not a single tumor which had come under his notice had been much reduced in size. By galvano-puncture he meant puncture through the vagina, and this, in his opinion, was the ideal treatment for the cure of uterine fibro-myoma. The four cases in which he had employed it had been absolutely cured—that is, the tumors disappeared entirely, not a vestige being left. In one of the cases a single puncture gave rise to sloughing, and this sloughing itself destroyed the growth; in the others the cure was directly due to the effects of the electrical treatment. He was, therefore, a decided believer in galvano-puncture. At the same time, he believed it had its risks, and he thought it should never be employed at a physician's office.

DR. FRANKLIN H. MARTIN, of Chicago, exhibited a portable battery, and made some remarks upon the use

of electricity in the treatment of certain pelvic diseases of the female (page 57).

DR. G. BETTON MASSEY, of Philadelphia, then said that Dr. Goelet's canula might itself answer as an electrode, which would have the special advantage of allowing the gas to escape through it. In speaking of the treatment of pelvic cellulitis, he said that in one case he had been using simple vaginal applications of the strength of seventy-five milliamperes with very good results. In the use of electricity in gynecological practice he thought too much attention was paid to antiseptic washes. These were not necessary, he thought, if perfectly clean and aseptic electrodes were employed. Dr. Massey agreed with Dr. Laphorn Smith in his explanation of the action of bi-polar faradization, but said he could not agree with him as to the use of the coarse wire as contrasted with that of the fine.

He could not agree with Dr. Mundé in his opinion of the milliamperemeter. He considered it of importance if more than five or six cells were employed. As to the sensations of the patient furnishing a guide for the strength of the current, he had seen as active a sensation caused by fifteen milliamperes with the negative pole in the uterus, as resulted from 350 milliamperes in other cases. In regard to the use of electricity in pyosalpinx, he had met with one instance in which the treatment for endometritis excited a flow of pus. He had reported the case to the Obstetrical Society of Philadelphia, and the patient had since then been quite well. The passing of the electrode in the direction of the left cornua of the uterus seemed to have been efficient in causing the result named.

DR. BUCKMASTER read some remarks, prepared by Dr. A. J. C. Skene, of Brooklyn, who was prevented from being present (page 39).

DR. H. J. BOLDT, of New York, after speaking of the theory of the bi-polar action of the current on the tissues, went on to say that those gentlemen who absolutely denied any value to electricity were those who had never given it an honest trial. They had no right to operate on any patient until electricity had been given a thorough test. That it would not, however, in every instance even alleviate the symptoms he thought was perfectly true. As to pyosalpinx, he thought that these cases were cured when the tubes were cut out, and not otherwise. When the tubes were distended and the uterine extremities were closed, or when the tubes were agglutinated, what could be expected from electricity? All that could be done then was to remove the tubes by laparotomy. But as long as the calibre of the tubes remained patent, it was well to try everything. Many mistakes, he said, were made in diagnosis, and he thought it was not advisable to be too enthusiastic.

DR. GOELET in closing the discussion, said he had cured at least thirteen cases by galvano-puncture, which otherwise could not have been relieved except by laparotomy—that is to say, the patients would otherwise have been mutilated; and he thought it was only right to try to cure these patients before mutilating them. By emptying the tubes and the use of the current subsequently, the tubes might be rendered patent. He thought that the pus could be first emptied, and then the removal of the cause of the accumulation of the pus effected. The resolution of the proximal end of the tube could be produced by galvanism of the endometrium, and he was very glad to hear that in this particular his experience had been confirmed by Dr. Massey in the case related. He did not think that we ought to say that the removal of the tubes was a cure of pyosalpinx. It was a mutilation, and not a cure, and in many cases, indeed, the

patient's condition was more embarrassing after the operation than before.

He thought that many of the failures with electricity which Dr. Mundé said he had met with were to be attributed to the fact of his having used his currents too weak. Then, again, he thought that Dr. Mundé had made a mistake in regarding the milliamperemeter as a plaything. Many women would bear intense pain and say nothing about it, and electricity might be thus administered in dangerous doses. It was also impossible to estimate the particular resistance of the tissues in every case; and, for these reasons, the meter was always an important auxiliary.

THE CHAIRMAN asked Dr. Goelet whether his experience of intra-uterine galvanism had demonstrated to him the fact that an occluded tube had become patulous again, and was performing its function in a normal manner. He said that, of course, the fact of fecundation occurring did not imply that both tubes were functioning.

In reply, DR. GOELET said that he could only assume that complete recovery had ensued from the fact that all symptoms were completely removed, that menstruation became normal, and that there had been no reaccumulation in the affected tube.

WAITE & BARTLETT MFG. CO.

ELECTRICAL INSTRUMENTS

For Medical Use.



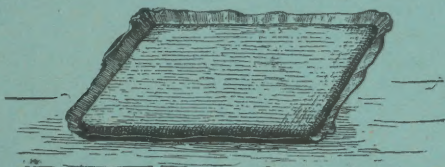
Warerooms, 143 East 23d St.
Factory, 204 & 206 East 23d St.

NEW YORK CITY.

20-CELL PORTABLE GALVANIC BATTERY. Net, \$22.50.

This battery, with proper electrodes, will give over 300 milliamperes.

As used in
treating
fibroid tumors.



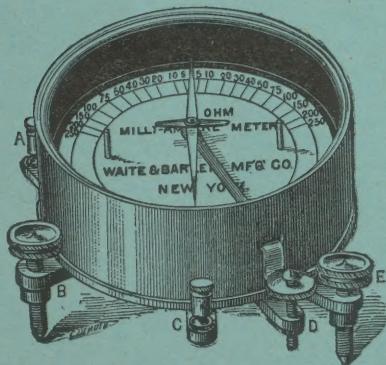
Made in a
variety
of sizes.

DR. GOELET'S CLAY ELECTRODE. \$3.00.

This MILLIAMPERE METER

measures up to 250 M.A.
and is warranted
to be correct.

Price, \$15.
With mirror, \$16.



STATIC MACHINES

acknowledged to be the
best in the world.

CABINETS

have the finest combina-
tion of electrical appli-
ance that can be
made.

STORAGE BATTERIES

of the very latest and most improved construction.

ANY ELECTRODES

desired can be obtained from us.

PLEASE SEND FOR ILLUSTRATED CATALOGUE.

THE AMERICAN JOURNAL OF THE MEDICAL SCIENCES

Published Monthly at \$4.00 per Annum

ENTERS upon its seventy-first year with assurances of increased usefulness. Encouraged by the emphatic endorsement of the profession, as indicated by a growth in its subscription list of fifty per cent. since its appearance as a monthly at a reduced price, those in charge will spare no effort to maintain its place as the leader of monthly medical literature. Being the medium chosen by the best minds of the profession during the past seventy years for the presentation of their ablest papers, *THE AMERICAN JOURNAL* has well earned the praise accorded it by an unquestioned authority—"From this file alone, were all other publications of the press for the last fifty years destroyed, it would be possible to reproduce the great majority of the real contributions of the world to medical science during that period." Original Articles, Reviews and Progress, the three main departments into which the contents of *THE JOURNAL* are divided, will be found to possess still greater interest than in the past. The brightest talent on both sides of the Atlantic is enlisted in its behalf, and no effort will be spared to make *THE JOURNAL* more than ever worthy of its position as the representative of the highest form of medical thought.

COMMUTATION RATE.

Taken together, *THE JOURNAL* and *NEWS* form a peculiarly useful combination, and afford their readers the assurance that nothing of value in the progress of medical matters shall escape attention. To lead every reader to prove this personally the commutation rate has been placed at the exceedingly low figure of \$7.50.

SPECIAL OFFERS.

THE MEDICAL NEWS VISITING LIST (regular price, \$1.25), or *THE YEAR-BOOK OF TREATMENT* (regular price, \$1.25) will be furnished to advance-paying subscribers to either or both of these periodicals for 75 cents apiece; or, *JOURNAL, NEWS, VISITING LIST* and *YEAR-BOOK*, \$8.50.

LEA BROTHERS & CO., PUBLISHERS, PHILADELPHIA.